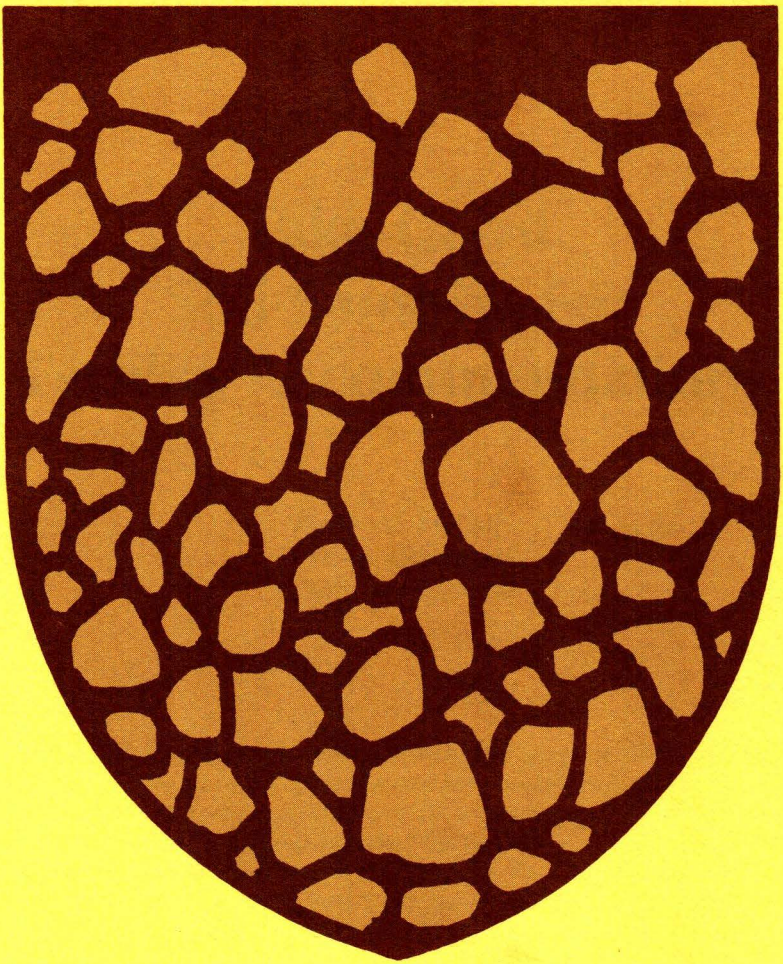
University of Hawaii
Cooperative Extension Service
Circular 428

Take Good Soil Samples For Fertility Recommendations



KNOW YOUR SOIL

Take Good Soil Samples For Fertility Recommendations

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The purpose of soil testing is to determine the level of plant nutrients available in the soil. This and other information are used to make recommendations for the most efficient and profitable use of fertilizer and lime. The soil test is only as good as the soil sample submitted for testing. Poor soil samples result in recommendations that are misleading or inaccurate. Good soil samples provide reliable recommendations that lead to more profitable crop production. This circular tells you how to take good soil samples for fertility recommendations.

Sample Carefully

The soil sample should be representative of the area sampled. The total amount of soil used for the soil test is very small when compared to the total amount of soil in an area. This means that samples must be taken and handled with care to provide accurate information for fertility recommendations.

Divide Farm into Sampling Areas

First step is to divide the farm or area into different sampling areas. Sampling areas should represent one or more of the following characteristics: productivity, topography, texture, drainage, color of top soil, past management, and crop to be grown. If these conditions are uniform throughout the area, each sample may represent as much as 10 or 15 acres. However, if there are great variations in these characteristics, the area should be divided accordingly. Unusual areas such as wet spots, dead furrows, old house sites, areas close to unpaved roads, areas where animals have been penned, etc., should be avoided or sampled separately, because these are not typical and will result in misleading information. Soil samples may be taken and submitted for testing anytime.

Figure 1. Divide the farm or area into sampling areas. Samples from each area should be kept separate. This farm has seven sampling areas.

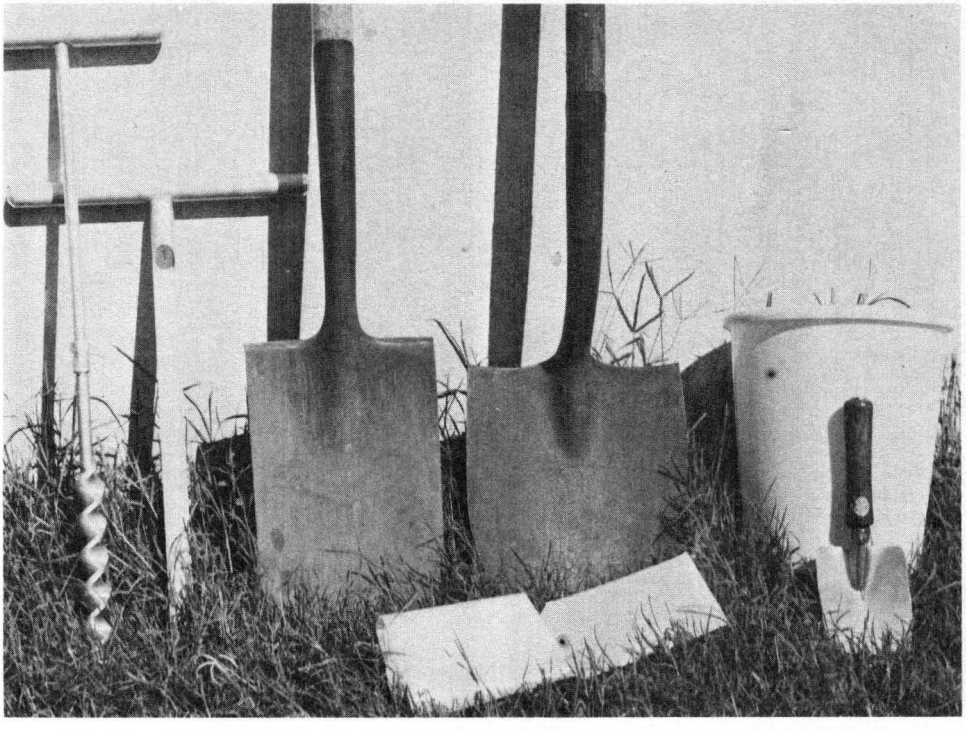
Select Equipment Needed

Choose the proper tool for taking the sample. A soil auger or drill, soil sampling tube or probe, garden spade or shovel, or a garden trowel may be used for taking the sample. A bucket, pail, or pan to place the soil in for mixing, a plastic sample bag or other container, labelling materials, and a soil record sheet are other items of equipment that will be needed. Be sure that *all* equipment and containers are clean to minimize danger of contamination.

Sample to Proper Depth

Take samples to the depth of the root zone of the crop or plant to be grown. This depth varies with different types of plants: four (0-4) inches for lawn grasses, six (0-6) inches for pasture grasses, eight (0-8) for garden and most field crops, and eight (0-8) inches plus a subsoil sample from eighteen to twenty-four (18-24) inches for trees and larger ornamental plants. Samples should be taken in a moist condition, not too wet or too dry. Wait 24 to 36 hours after heavy rains

Figure 2. Select the equipment needed. Use a soil auger (or drill), soil sampling tube or probe), garden spade or shovel, garden trowel, container for mixing samples, container for sending the sample, labelling materials, soil record sheet (Cooperative Extension Service Form 312) and pencil. All equipment should be clean to avoid contamination of the sample.



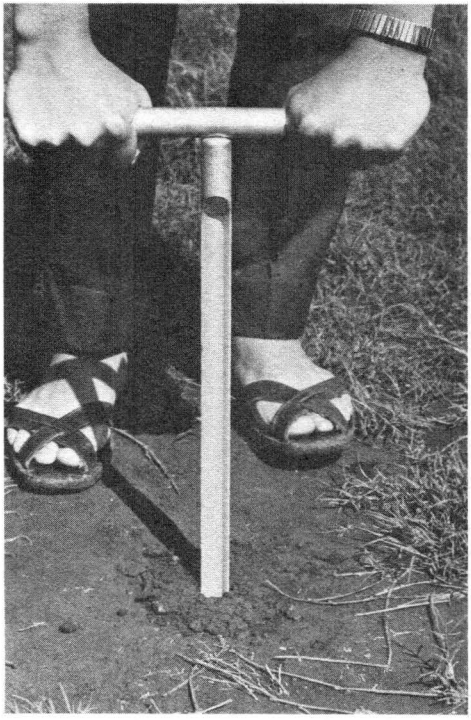
or after watering before taking the sample.

Make Composite Sample

A minimum of ten samples should be taken from each sampling area. The more samples that are taken, the more representative the sample will be. Each sample should be a column of soil about one inch in diameter and the length of the proper depth for the specific crop. Place these samples in the clean pail or other container and thoroughly mix to form a composite sample. Mix with the trowel or other clean utensil. Do not use your hands unless they are clean or you are wearing clean gloves. The hands may be a major source of contamination under some conditions, for example, after handling fertilizers. Take one pint or two (2) cupfuls of soil from the composite sample for testing.

Figure 3. Take sample to proper depth. Four (0-4) inches for lawns, six (0-6) inches for pasture grasses, eight (0-8) inches for vegetables and most field crops, eight (0-8) inches and a subsoil sample eighteen to twenty-four (18-24) inches for tree crops.

A. Use the soil sampling tube (or probe) push to proper depth, and place soil in clean container to make composite sample. B. Use the shovel: Cut "V" shaped hole to proper depth, slice layer of soil one inch thick from one side of hole, remove and discard all of soil except a column one inch wide, place this column of soil in clean container to make composite sample.



Place Soil in Container

Place the soil in a clean plastic bag such as those used for freezing fruits and vegetables. This container should be airtight so that the sample does not dry out. Most of the soils in Hawaii contain minerals that change in composition as they dry. This in turn changes the nature of the soil so that the sample no longer truly represents the soil from which it was taken. This gives misleading results when tested. As samples are taken, they should be placed in the airtight container immediately and shipped to the soil testing laboratory as soon as possible.

Label Each Sample

Clearly label each sample with your name and a sample number so that it is easily identified. Do not place the label inside the container with the soil. The moist soil causes the label to deteriorate so that the sample cannot be identified. An unidentifiable sample has no value, so take care that the

Figure 4. Make composite sample: Take a minimum of 10 samples from each sampling area, place in clean container, and mix thoroughly. Do not use hands for mixing soil unless they are clean.

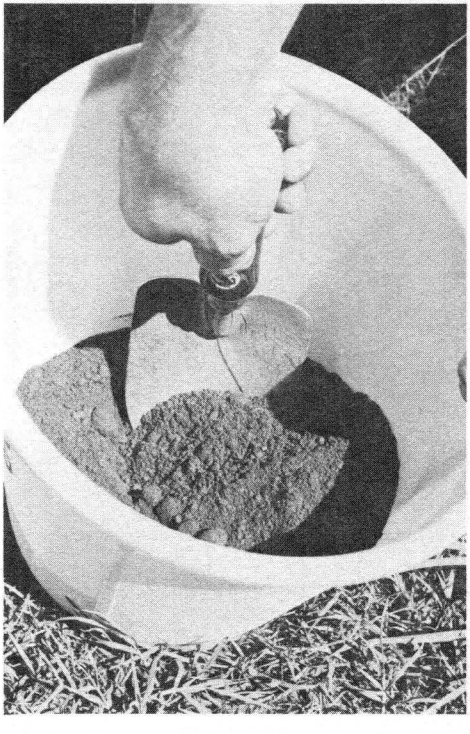
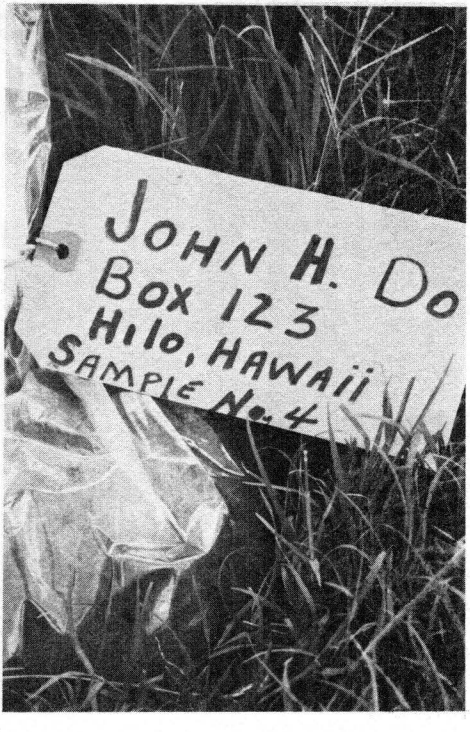


Figure 5. Place composite soil sample in a clean container. Label samples clearly. Keep a record of each sample.



sample is easily identified. It is suggested that you make a map of your farm or area and that the area from which each sample was taken be marked so that you will know the conditions on your farm or area.

Fill Out Soil Record Sheet

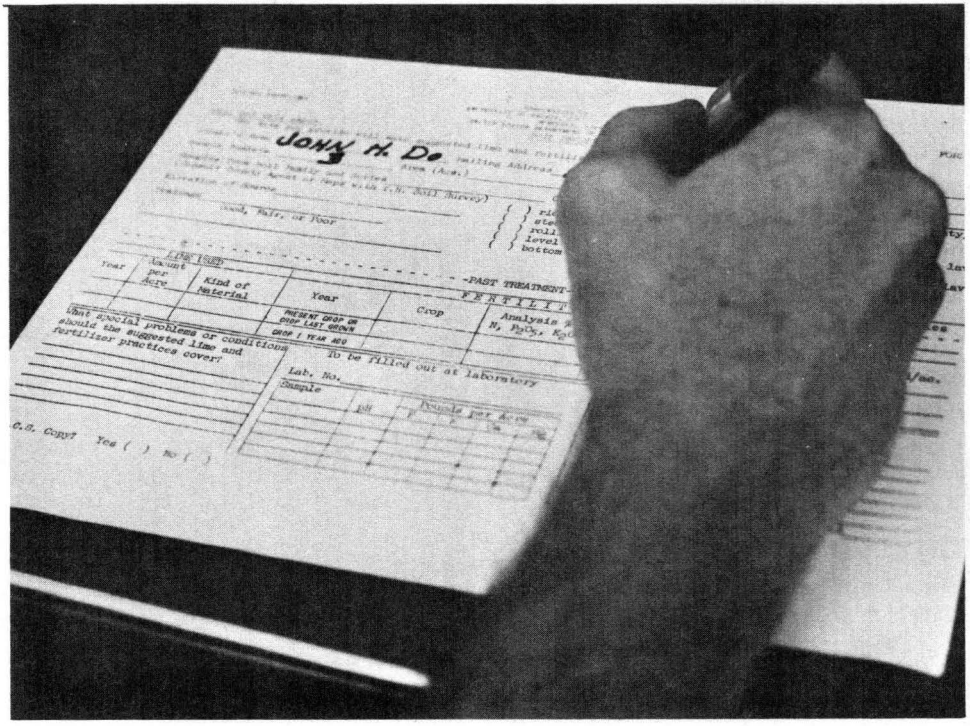
Fill out a soil record sheet (Cooperative Extension Service Form 312).* This should be filled out completely and accurately with the required information. This provides the laboratory with the information needed to provide a useful recommendation. All recommendations are based upon the information available. If this information is adequate and accurate, the recommendation will be dependable. If not, the recommendation may be very misleading.

When to Sample

Soil samples should be taken and tested for each crop that is to be planted. For perennial crops, such as pastures, samples should be submitted every 3 to 5 years. For orchards also, samples should be tested every 3 to 5 years. For sugar cane and pineapple,

*Obtain this form from your local County Extension Office or it may be filled out at the Department of Agronomy and Soil Science, 2525 Varney Circle, University of Hawaii.

Figure 6. Fill out soil record sheet (Cooperative Extension Service Form 312) completely. Send sheet in with soil sample. Obtain the soil record sheet from your County Agent.



soils should be tested before each plant crop. For bananas and papayas, samples should be taken before each plant crop. For vegetables, samples should be taken before each crop to be grown. Samples should be taken and submitted in sufficient time to allow for handling and testing before the results are needed.

Samples should be given to your local County Extension Agent or may be sent directly to the Department of Agronomy and Soil Science, 2525 Varney Circle, University of Hawaii, Honolulu, Hawaii 96822. Please clearly mark each package "Soil Samples" to facilitate handling.

Where to Get Help

The Cooperative Extension Service of the University of Hawaii has an office in each County. There are County Extension Agents in each County who can assist you in taking your soil sample. They can also assist you with the information needed to fill out the soil record sheet. All needed materials may be obtained from the County Agent. Please feel free to call upon the agents to help you.

LOCATION OF COUNTY OFFICES		PHONE
HAWAII COUNTY		
Federal Building, Hilo	Hilo	52-804
State Office Building, Honokaa	Honokaa	754-201
Kamuela	Kamuela	855-185
State Office Building, Naalehu	Naalehu	693-085
Kainaliu	Kona	236-355
KAUAI COUNTY		
State Office Building, Lihue	Lihue	2-036
MAUI COUNTY		
Post Office Building, Wailuku	Wailuku	33-242 33-254
Kealahou Community Hall, Waiakoa	Kula	783-065
State Office Building, Kaunakakai	Molokai	33-215
OAHU COUNTY		
Wahiawa Civic Center	Wahiawa	622-4185
State Office Building, Kaneohe	Kaneohe	247-0421
555 Paiea Street, Honolulu	Honolulu	870-871
85-876 Farrington Highway, Waianae	Waianae	613-908

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